## Claims

[c1]     1. A method of adaptively controlling the speed of a reference vehicle having a controller comprising:

detecting a target vehicle;

setting a reference vehicle headway distance indicative of a desired separation between said reference vehicle and said target vehicle;

receiving at said reference vehicle, target vehicle data from said target vehicle; and

modifying said reference vehicle headway distance as a function of said target vehicle data.

[c2]     2. A method according to claim 1 wherein said target vehicle data includes a braking capability value ($BC_T$) for said target vehicle, and wherein the step of modifying includes modifying said reference vehicle headway distance as a function of said $BC_T$.

[c3]     3. A method according to claim 1 wherein said target vehicle data includes data comprising at least one of: a tire pressure value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; target vehicle speed; or a road condition value.

[c4]     4. A method according to claim 2 wherein modifying said reference vehicle headway distance includes increasing said reference vehicle headway distance if said $BC_T$ indicates less than an optimum braking capability.

[c5]     5. A method according to claim 1 wherein said target vehicle data includes a target vehicle operator attention value indicative of a level of potential target vehicle operator distraction.

[c6]     6. A method according to claim 1 comprising:

determining a braking capability value ($BC_R$) for said reference vehicle, and wherein said step of modifying includes modifying said reference vehicle headway distance as a function of said $BC_T$ and said $BC_R$.

[c7]     7. A method according to claim 6 wherein determining said $BC_R$ comprises analyzing reference vehicle data comprising at least one of: a tire pressure

value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; reference vehicle speed; or a road condition value.

[c8]     8. A method according to claim 6 wherein modifying said reference vehicle headway distance includes increasing said reference vehicle headway distance if said $BC_R$ indicates less than an optimum braking capability.

[c9]     9. A method according to claim 7 wherein said reference vehicle data includes a reference vehicle operator attention value indicative of a level of potential reference vehicle operator distraction.

[c10]     10. A method of adaptively controlling the speed of a reference vehicle having a controller comprising:

detecting a target vehicle;

setting a reference vehicle headway distance indicative of a desired separation between said reference vehicle and said target vehicle;

receiving at said reference vehicle, a braking capability value ($BC_T$) for said target vehicle;

generating a braking capability value ($BC_R$) for said reference vehicle; and

modifying said reference vehicle headway distance as a function of said $BC_T$ and said

$BC_R$.

[c11]     11. A method according to claim 10 wherein determining said $BC_R$ comprises analyzing reference vehicle data comprising at least one of: a tire pressure value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; reference vehicle speed; or a road condition value.

[c12]     12. A method according to claim 11 wherein said $BC_T$ is generated at said target vehicle as a function of target vehicle data comprising at least one of: a tire pressure value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; reference vehicle speed; or a road condition value.

[c13]     13. A method according to claim 10 wherein said $BC_T$ includes a target vehicle operator attention value indicative of a level of potential target vehicle operator distraction.

[c14]  14. A method according to claim 10 wherein said $BC_R$ includes a target vehicle operator attention value indicative of a level of potential target vehicle operator distraction.

[c15]  15. A method according to claim 10 wherein modifying includes increasing said reference vehicle headway distance if said $BC_R$ indicates less than an optimum braking capability.

[c16]  16. A method according to claim 10 wherein modifying includes decreasing said reference vehicle headway distance if said $BC_T$ indicates less than an optimum braking capability.

[c17]  17. An adaptive cruise control system for a reference vehicle comprising:
a memory for storing reference vehicle data;
a detection system for detecting a target vehicle;
a receiver receiving target vehicle data from said detected target vehicle; and
a controller coupled to said memory for adaptively controlling a speed of said reference vehicle to maintain a reference vehicle headway distance indicative of a desired separation between said reference vehicle and said target vehicle, wherein said reference vehicle headway distance is generated as a function of said reference vehicle data and said target vehicle data.

[c18]  18. A system according to claim 17 wherein said reference vehicle data includes a braking capability value ($BC_R$) for said reference vehicle.

[c19]  19. A system according to claim 18 wherein said target vehicle data includes a braking capability value ($BC_T$) for said target vehicle.

[c20]  20. A system according to claim 17 wherein said reference vehicle data includes data comprising at least one of: a tire pressure value; a tire size value; a tread wear value; a tire temperature value; a vehicle weight value; target vehicle speed; or a road condition value.